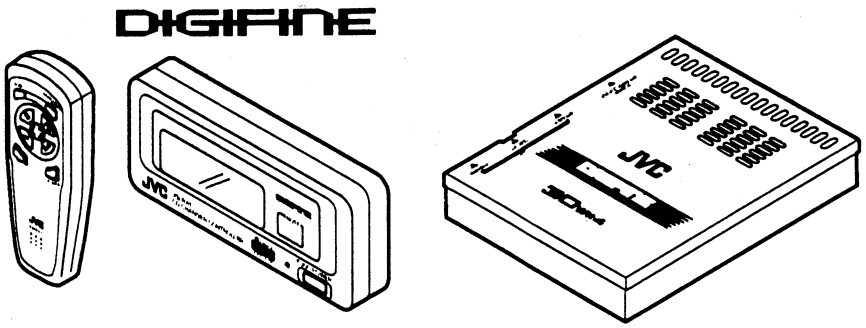
JVC

SERVICE MANUAL

) CHANGER CONTROLLER (WHITH POWER AMPLIFIER)

KS-RA1



COMPACT disc DIGITAL AUDIO

Area Suffix	
C	Canada
J	U.S.A

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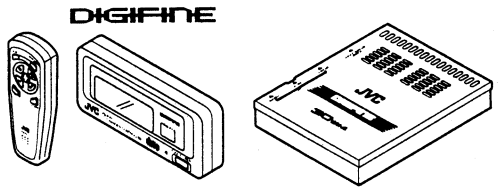
■ Instructions

JVC

CD CHANGER CONTROLLER (With Power Amplifier)

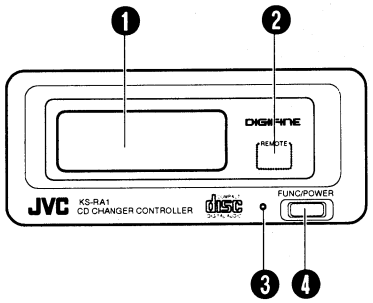
KS-RA1 C/J

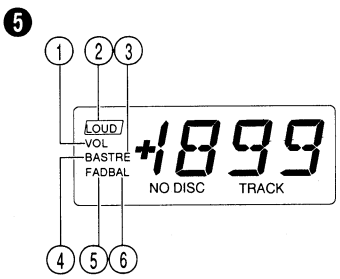


COMPACT disc DIGITAL AUDIO

INSTRUCTIONS

LOCATION OF CONTROLS





(Display unit)

❶ Display window
❷ REMOTE sensor section
❸ Microcomputer reset button
❹ Function (FUNC)/POWER button
FUNC: Press this button while the power is ON to select the sound source (CD changer, AUX (speaker input)).
POWER: Press to turn the power ON. Press for more than 1 second to turn the power OFF.

❺ Indicators
① Volume (VOL)
② Loudness (LOUD)
③ Treble (TRE)
④ Bass (BAS)
⑤ Fader (FAD)
⑥ Balance (BAL)

ENGLISH

Thank you for purchasing this JVC product. Please read these instructions carefully before starting operation to be sure to obtain optimum performance and a longer service life from the unit.

INFORMATION (For U.S.A.)

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CONTENTS

Features 3
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FEATURES

The KS-RA1, together with a JVC CD changer, provides high quality and high-powered CD sound, even when connected to your existing receiver.

WARNINGS

- This unit is designed to operate with 12 volts DC, negative ground electrical systems only.
- When replacing the fuse, be sure to use a 10-ampere fuse. If the fuse blows frequently, consult your nearest JVC car audio dealer.

PRECAUTIONS

- This unit is for the control of JVC Compact Disc Automatic Changer **(Applicable models: XL-MK500/MG1800, KD-MK70/MK66/MK77)**. For use of the CD automatic changer, refer to its instructions.
- When there is no disc in the disc magazine of the CD automatic changer or when the disc is inserted into the tray upside down, "NO DISC" will be shown in the KS-RA1 display. In such a case, remove the disc magazine from the CD changer and reload the discs correctly.
- When "R-1" to "R-8" is shown in the display of KS-RA1, confirm that the cord is connected correctly and press the microcomputer reset button of the KS-RA1 and the CD changer.
- When "R-5" is shown in the display with this unit connected to the XL-MG1800, close the CD changer door.
- When the display of the KS-RA1 shows "R-8", confirm that the unit is connected to the CD automatic changer.

INSTALLATION

The display unit can be installed separately from the amplitier unit, for ease of operation.

- **Installing the amplitier unit**
  Install as shown in Fig. a, avoiding the outlet of the car's heater.

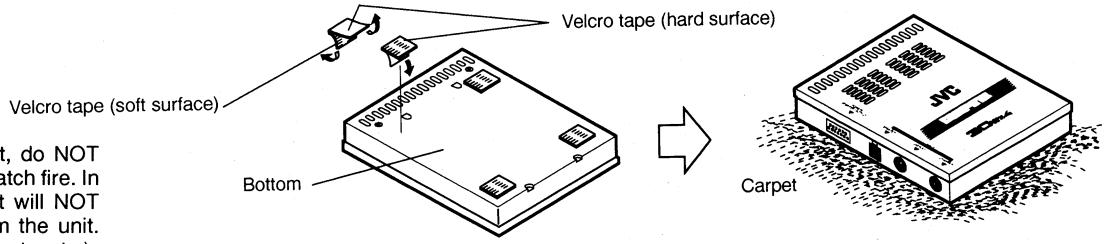


Fig. a

Note:
Since heat is generated in this unit, do NOT mount it near anything which could catch fire. In addition, mount it in a location that will NOT prevent the dissipation of heat from the unit. (Avoid mounting this unit under car mats, etc.)

- Installing the amplifier unit on the carpet.

- Installing the amplifier unit directly on the car floor.

Note:
When the installation position has been determined, confirm that the cords are sufficiently long.

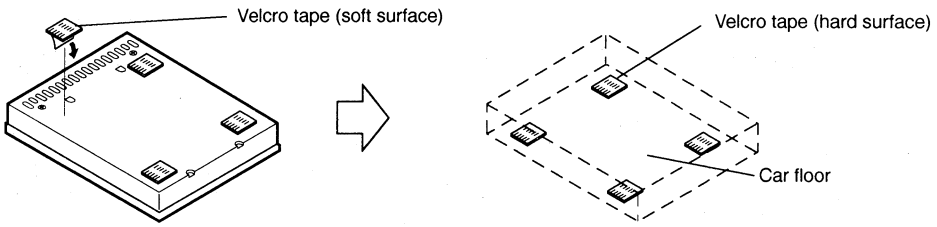
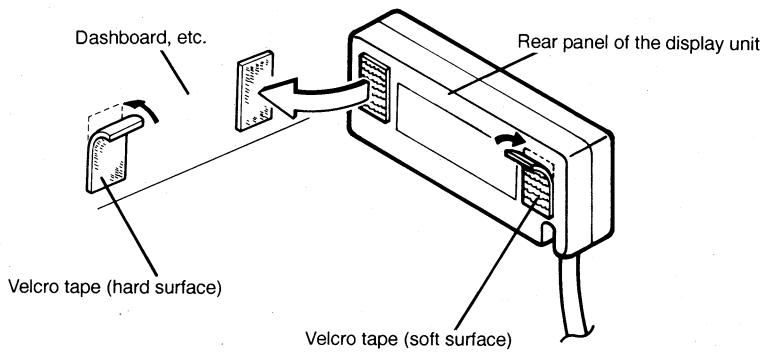


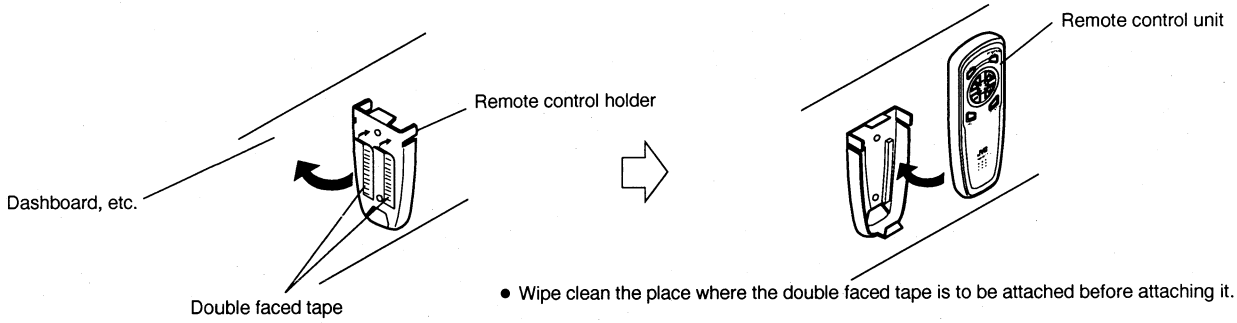
Fig. b

- **Installing the display unit**
  Install as shown in Fig. b on a flat surface (dashboard, console, etc.) where it can be attached securely and where it can be operated easily, using Velcro tape.

Notes:
- For safe driving, install the unit in a place where operation of the display unit will not interfere with driving. (Avoid installing where it would be too high (roof, etc.).)
- Avoid placing the unit in a place subject to excessive heat, direct sunlight, etc.
- Wipe the place where the Velcro tape is to be attached clean before attaching it.
- Do not drop or apply excessive shocks to the unit.
- Do not disassemble the unit.



- **Attaching the remote control holder**



- Wipe clean the place where the double faced tape is to be attached before attaching it.

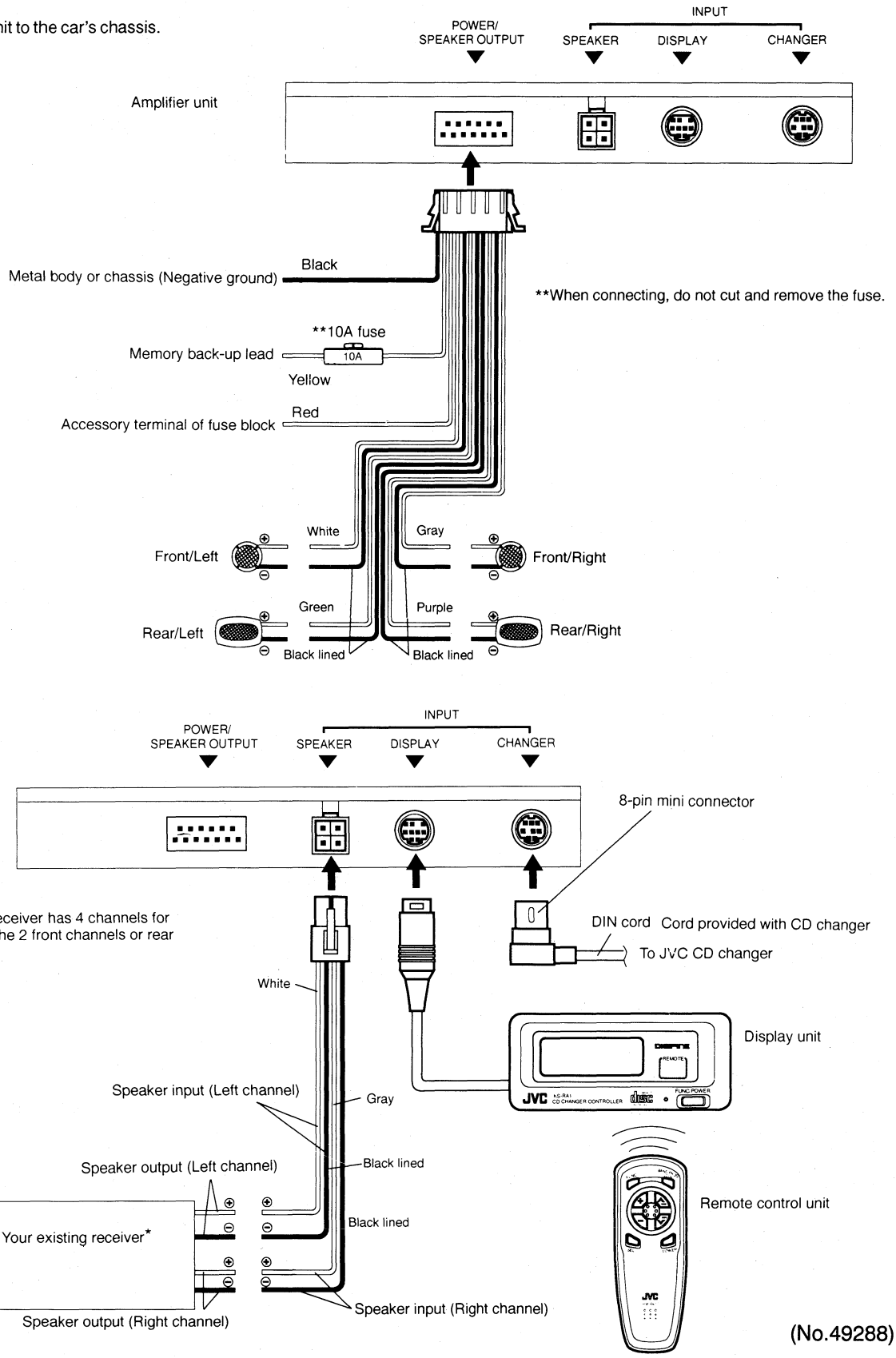
ELECTRICAL CONNECTIONS

To prevent short circuits from occurring, while making connections, keep the battery's negative terminal disconnected.
We recommend that you make all electrical connections before installing the unit. If you're not sure of your ability to install this unit correctly, have it installed by a qualified service technician.

Note:
This unit is designed for use in cars with a 12-volt DC, negative ground power supply. If your vehicle does not have a 12-volt negative ground electrical system, you will need a voltage inverter which can be bought from a JVC car audio dealer.

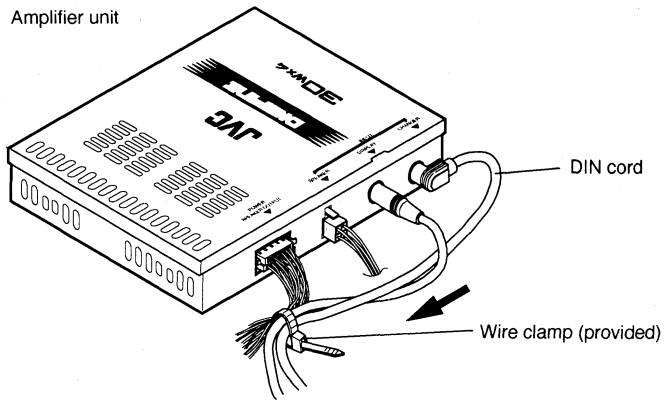
- Be sure to ground this unit to the car's chassis.

A. Connections



Tie up the DIN cord with the provided wire clamp.

Pull the cord taut in the direction of arrow, then tie it to the other cords.



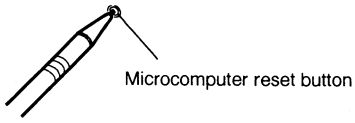
B. Memory back-up lead

Connect this lead to a position where live power is supplied even when the ignition key is taken out.

Microcomputer reset button

After completing installation and connection...

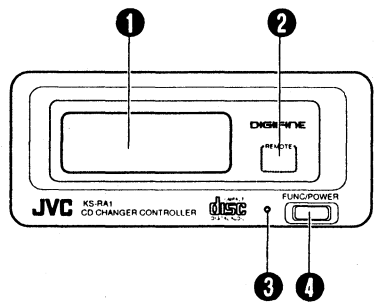
- Press both the microcomputer reset button of the CD changer and that of the display unit to reset the microcomputer.

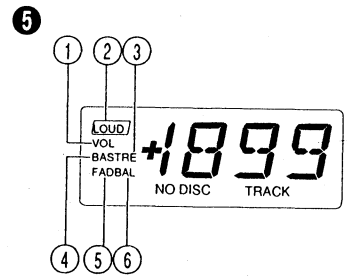


LOCATION OF CONTROLS

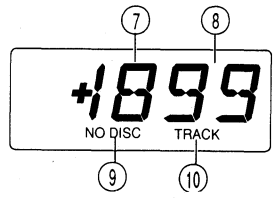
(Display unit)

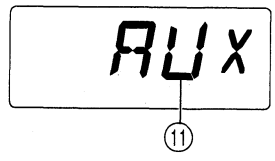
❶ Display window
❷ REMOTE sensor section
❸ Microcomputer reset button
❹ Function (FUNC)/POWER button
FUNC: Press this button while the power is ON to select the sound source (CD changer, AUX (speaker input)).
POWER: Press to turn the power ON. Press for more than 1 second to turn the power OFF.
❺ Indicators
① Volume (VOL)
② Loudness (LOUD)
③ Treble (TRE)
④ Bass (BAS)
⑤ Fader (FAD)
⑥ Balance (BAL)





⑦ Disc number (1-18)
Level value
⑧ Track number (1-99)
⑨ DISC
NO DISC
⑩ TRACK
⑪ AUX

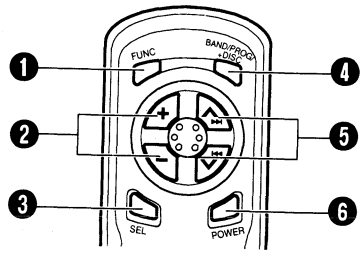




(Remote control unit)

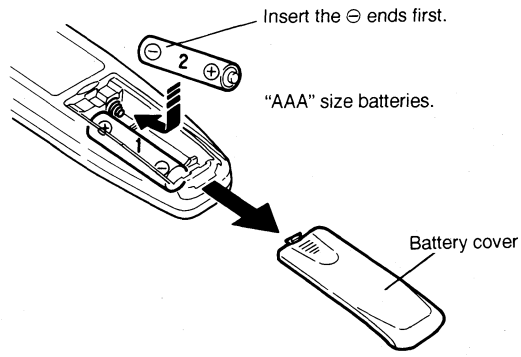
❶ Function (FUNC) button
Used to select the source. (CD Changer/AUX (speaker input))
❷ Level Control (+, –) buttons
❸ Electronic Control Mode Select (SEL) button
❹ BAND/PROG/+DISC button
- The BAND and PROG functions are not available with the KS-RA1.

❺ Skip/Search (►►I, I◄◄) buttons
❻ POWER button



- Installing batteries in the remote control unit.

- **Battery replacement**
  When the remote control operation becomes unstable or the distance from which remote control is possible becomes shorter, replace the batteries with new ones.

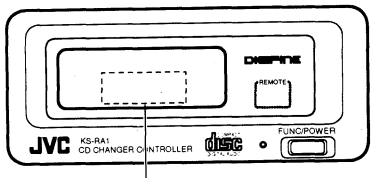


Using the remote control unit

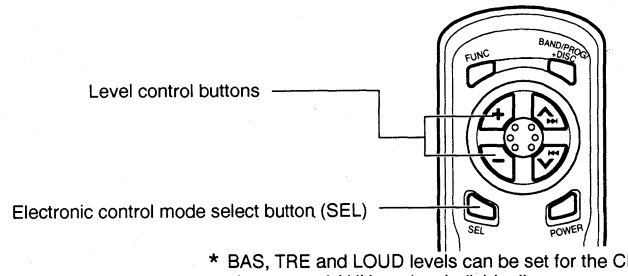
To use the remote control unit, point it at the remote sensor and press the buttons gently and firmly.
Do not expose the remote sensor to strong light (direct sunlight or artificial lighting) and make sure that there are no obstacles between the remote sensor and the remote control unit.

Audio Level Control

Electronic control mode (SEL)		⊖	⊕
VOL	Volume	Decreases (00– 50)	Boosts (00 – 50)
* BAS	Bass	Decreases (–06) – (00)	Boosts (+06) – (00)
* TRE	Treble	Decreases (–06) – (00)	Boosts (+06) – (00)
FAD	Fader	Rear (R05 – 00)	Front (00 – F05)
BAL	Balance	Left (L06 – 00)	Right (00 – R06)
* LOUD	Loudness	Off oFF	On on



Level value



* BAS, TRE and LOUD levels can be set for the CD changer and AUX modes, individually.

Loudness Control

At low volumes, the human ear is less sensitive to low and high frequencies. When the volume is low, set the loudness control to ON to boost these frequencies and produce well-balanced sound.

Fader Control

- **When used in a 4-speaker system**
  Use this control to balance the volume levels of the front and rear speakers. Set Fader mode using the SEL button and press the + Level Control button to decrease the volume level of the rear speakers, and – to decrease that of the front speakers. The overall volume level can be adjusted in Volume mode.
- **When used in a 2-speaker system**
  Set this control to the center position ("00" is displayed).

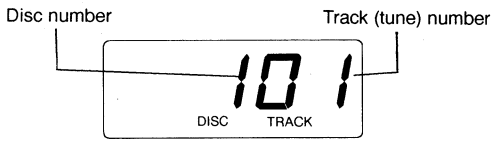
Adjusting the CD changer and AUX volume levels

1. **How to adjust the volume levels**
   ① Select the CD changer mode with the FUNC button.
   ② Adjust the volume level with the Level Control (+, –) buttons. (Control range from 00 to 50)
   ③ Select the AUX mode with FUNC button.
   ④ Tune to the desired broadcast station or start tape playback with your existing receiver or cassette receiver.
   ⑤ Adjust the volume level with your existing receiver's volume control to make it equal to that of the CD changer.
   (Switch between modes using the FUNC button.)

2. **If the power of your existing receiver is insufficient to raise the volume level to equal that of the CD changer, compensate for this using the Volume Offset function.**
   ① Select the AUX mode with the FUNC button.
   ② Press the SEL button for more than 2 seconds. Then the VOL indicator will blink.
   ③ While the VOL indicator is blinking, adjust to the appropriate level with the Level Control (+, –) buttons. (Control range from -06 to +06)

PLAYING COMPACT DISCS

To play all tracks (example: assuming 12 discs are loaded in the magazine)



❶ Switch ON.
The display window lights.
CD play starts when the disc number and track number indicators light.
❷ Adjust the volume using the remote control unit.

- When all the tunes on the first disc have been played, the second disc starts automatically from the first tuned.

- **To stop CD playback**
Press the POWER button of the remote control or display unit.

DISC SELECT BUTTON

During playback, press the +DISC button to listen to another compact disc.

- **Example: When the third CD is currently playing...**
Each time the +DISC button is pressed, the 4th, 5th, 6th... 12th and 1st disc... will be selected in sequence.

- During disc selection, the disc number and track number indicators blink.

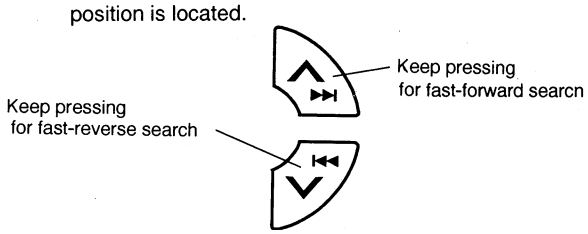
SKIP PLAYBACK

To listen to the next tune ...
Press the ►►I button once to skip to the beginning of the next tune.

To listen to the previous tune ...
Press the I◄◄ button to skip to the beginning of the tune being played back and press again to skip to the beginning of the previous tune.

SEARCH PLAYBACK (to locate the required position on the disc)

- The required position can be located using fast-forward or reverse search during playback.
- Hold down the button; search playback starts slowly and then gradually increases in speed.
- Since low-volume sound (about one quarter of the playback level) can be heard in both modes, release the button when the required position is located.



RADIO OR TAPE OPERATION

- **Listening to the sound from your existing receiver (car FM receiver, cassette car receiver, etc.)**

① Select the AUX mode with the FUNC button.
② Tune to the desired broadcast station with your receiver. (Or start tape playback.)
③ Adjust the volume level with the remote control unit.

SPECIFICATIONS

AMPLIFIER SECTION
Maximum Power Output: (Front) 30 watts per channel (Rear) 30 watts per channel
Continuous Power Output (RMS): (Front)
13 watts per channel into 4 Ω, 40 to 20,000 Hz at no more than 0.8% total harmonic distortion.
(Rear) 13 watts per channel into 4 Ω, 40 to 20,000 Hz at no more than 0.8% total harmonic distortion.
Load Impedance: 4 Ω (4 to 8 Ω allowance)
Frequency Response: 40 to 20,000 Hz
Input Sensitivity/Impedance: 4 V/1.5 kΩ
Signal-to-Noise Ratio: 70 dB

GENERAL
Power Requirements
Operating Voltage : DC 14.4 V (11 V - 16 V allowable)
Grounding System : Negative Ground
Dimensions (W x H x D)
Amplitier unit: 178 x 162 x 30 mm
(7-1/16" x 6-7/16" x 1-3/16")
Display unit : 88 x 38 x 17 mm
(3-1/2" x 1-1/2" x 11/16")
Gross Weight : 1.6 kg (3.6 lbs)

Design and specifications subject to change without notice.

If a kit is necessary for your car, consult your telephone directory for the nearest car audio speciality shop.

JVC
VICTOR COMPANY OF JAPAN, LIMITED

Printed in Singapore
VNN3695-631S

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1 Location of main parts

◆ **Power amplifier section**

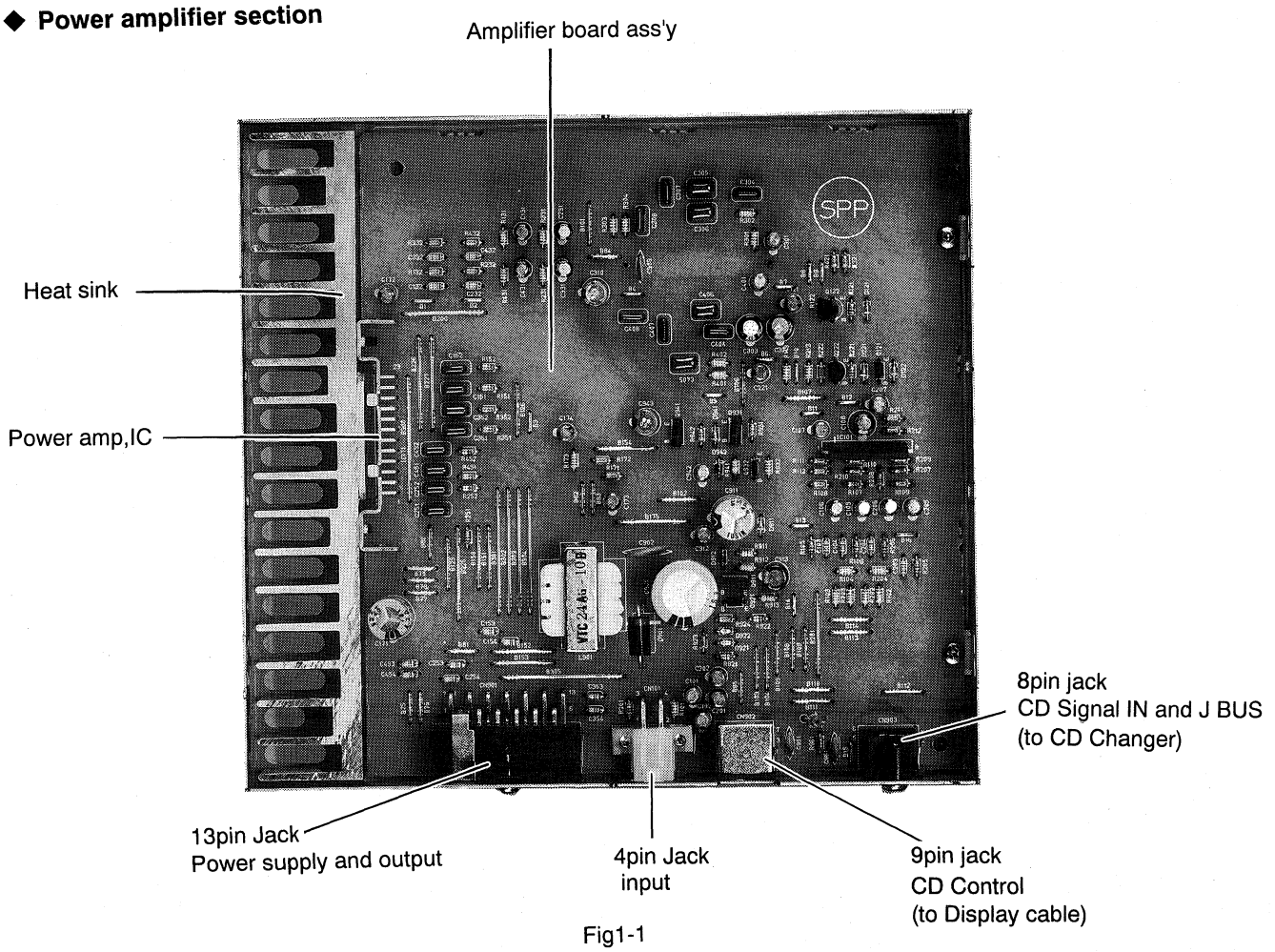


Fig1-1

◆ **Display section**

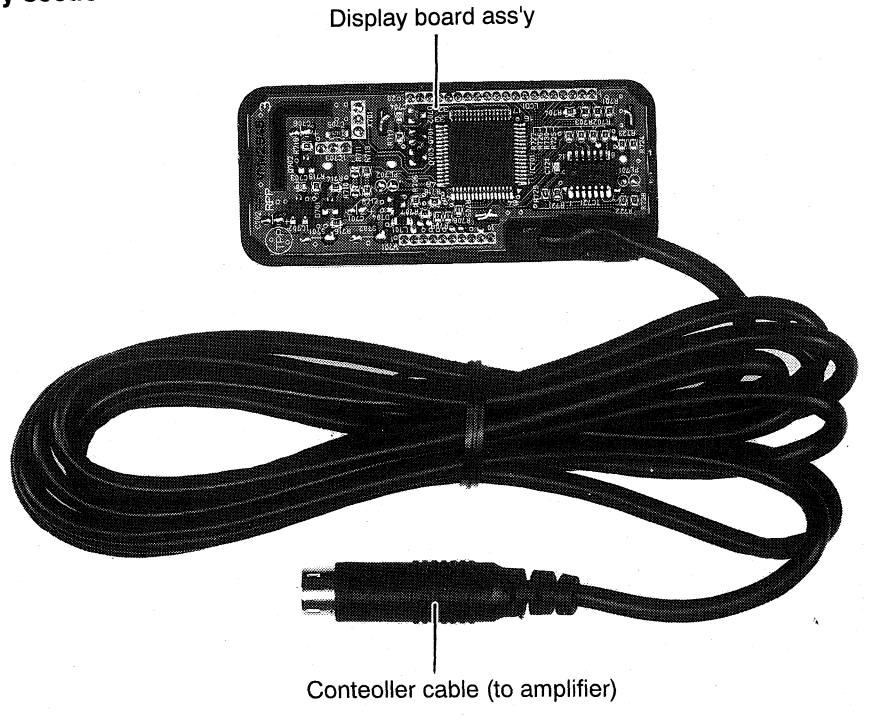


Fig1-2

2 Removal of main parts and Exploded view

■ Power Amplifier section

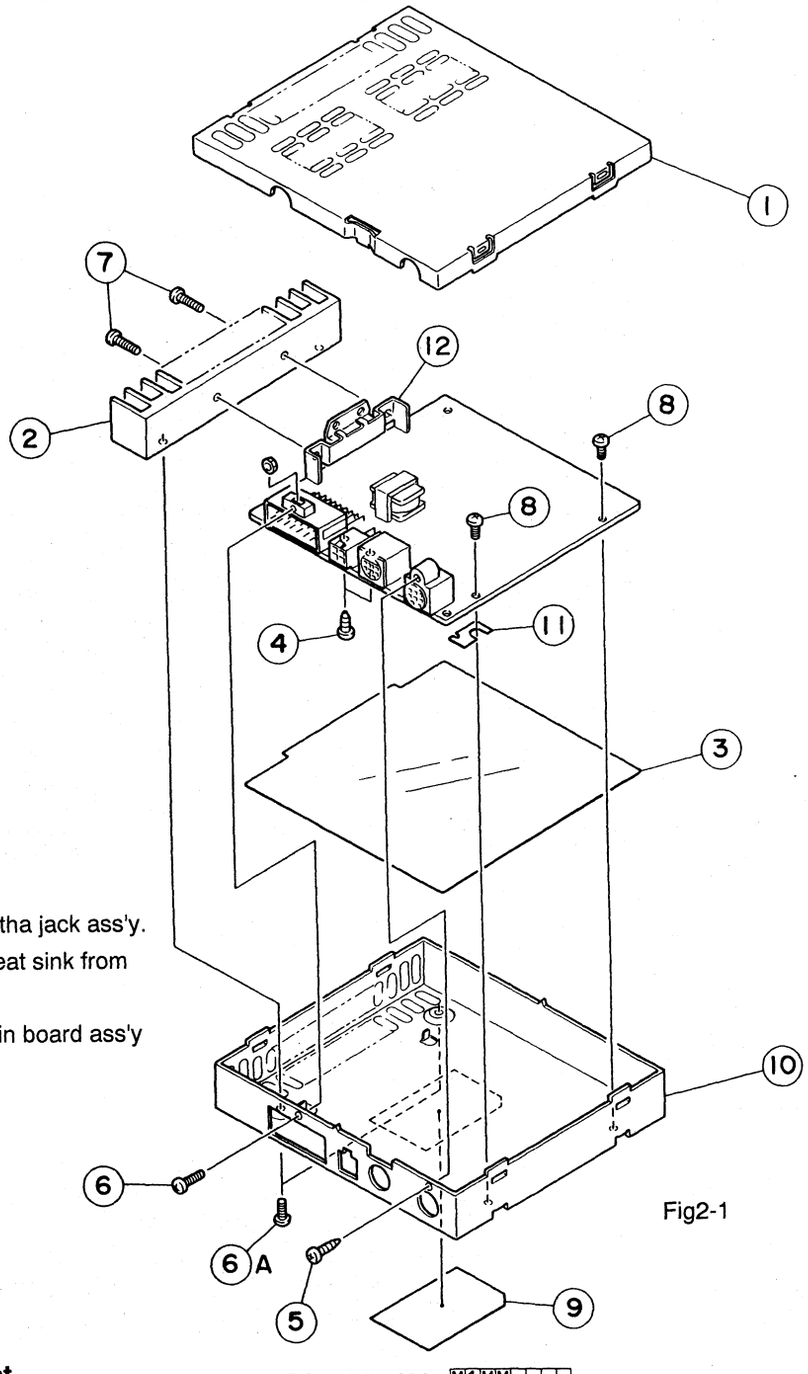


Fig2-1

◆ Removel of power amplifier

1.Remove top cover.

2.Remove two screws ⑤ and ⑥ retaining tha jack ass'y.

3.Remove two screws ⑥A retaining tha heat sink from bottom side.

4.Remove two screws ⑧ retaining tha main board ass'y

● Power amplifier section parts list

BLOCK NO. M1MM□□□

⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	QTY	SUFFIX	CLR
	1	VKL2750-001	TOP COVER		1		
	2	VJC3285-002	HEAT SINK		1		
	3	VMA4675-001	INSULATOR		1		
	4	SDSF3008Z	SCREW	CONECTOR+PWB	2		
	5	SDSF3008M	SCREW	JACK+CHASSIS	1		
	6	SDSP2606M	SCREW	13P+CHA,H.SI+CH	3		
	7	LPSP2610Z	SCREW	HEAT SINK+IC BK	2		
	8	SDSP2605Z	SCREW	CHASSIS+PWB	2		
	9	VYN3695-S001	NAME PLATE		1		
	10	VKL2749-001	CHASSIS		1		
	11	VMA4690-001	EARTH PLATE	FOR MAIN BOARD	1		
	12	VKL7829-001	IC BRACKRT	FOR IC171	1		

■ Controller (Display) section

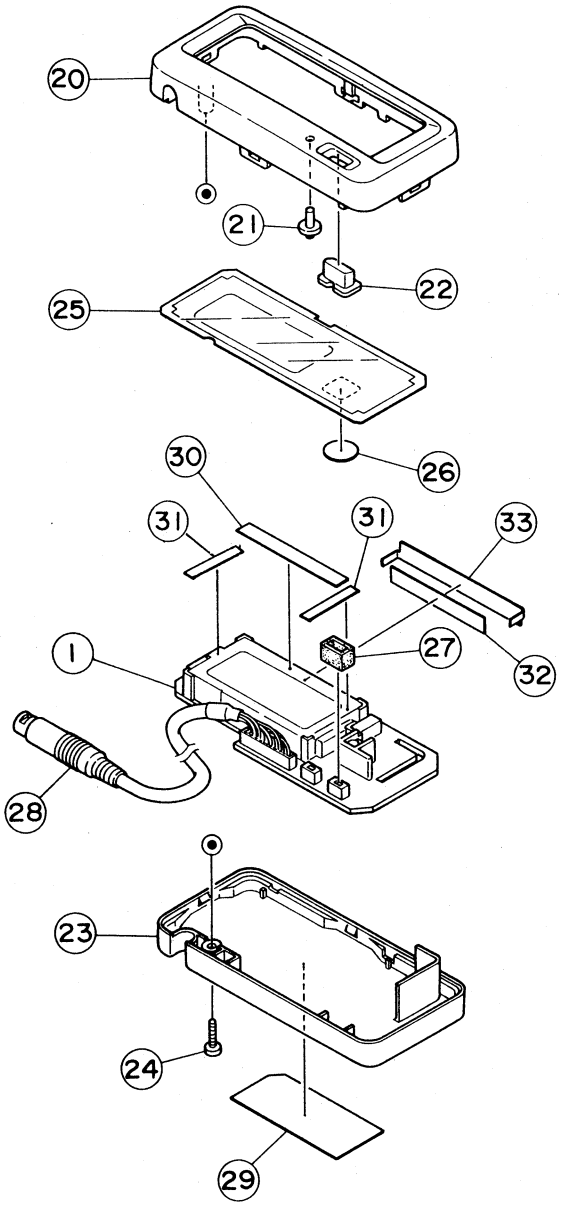


Fig2-2

◆ Removel of controller

1.Remove one screw ㉔ retaining the rear cover
2.Disengage fowr claws Ⓐ,Ⓑ,Ⓒ,and Ⓓ holding the board ass'y
3.Put out the board ass'y

● Controller section parts list

BLOCK NO. M2MM

⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	QTY	SUFFIX	CLR
	20	VJC2564-001	FRONT COVER		1		
	21	VXP5102-001	RESET BUTTON		1		
	22	VXP5153-003	PUSH BUTTON		1		
	23	VJC2565-001	REAR COVER		1		
	24	SPST2006N	SCREW	REAR COVER	1		
	25	VJK3685-001	FINDER		1		
	26	VYTT589-001	SHEET		1		
	27	VYTH524-001	BUTTON CUSHON		1		
	28	VMP3290-001	9P CORD ASSY	W701	1		
	29	VND4627-002	CAUTION LABEL		1		
	30	VYSS1R2-060	SPACER	48X2.5XT0.2	1		
	31	VYSS1R2-061	SPACER	18X2.5XT0.2	2		
	32	VYSS1R1-101	SPACER		1		
	33	VMA4683-003	EARTH PLATE		1		

3 Block diagram

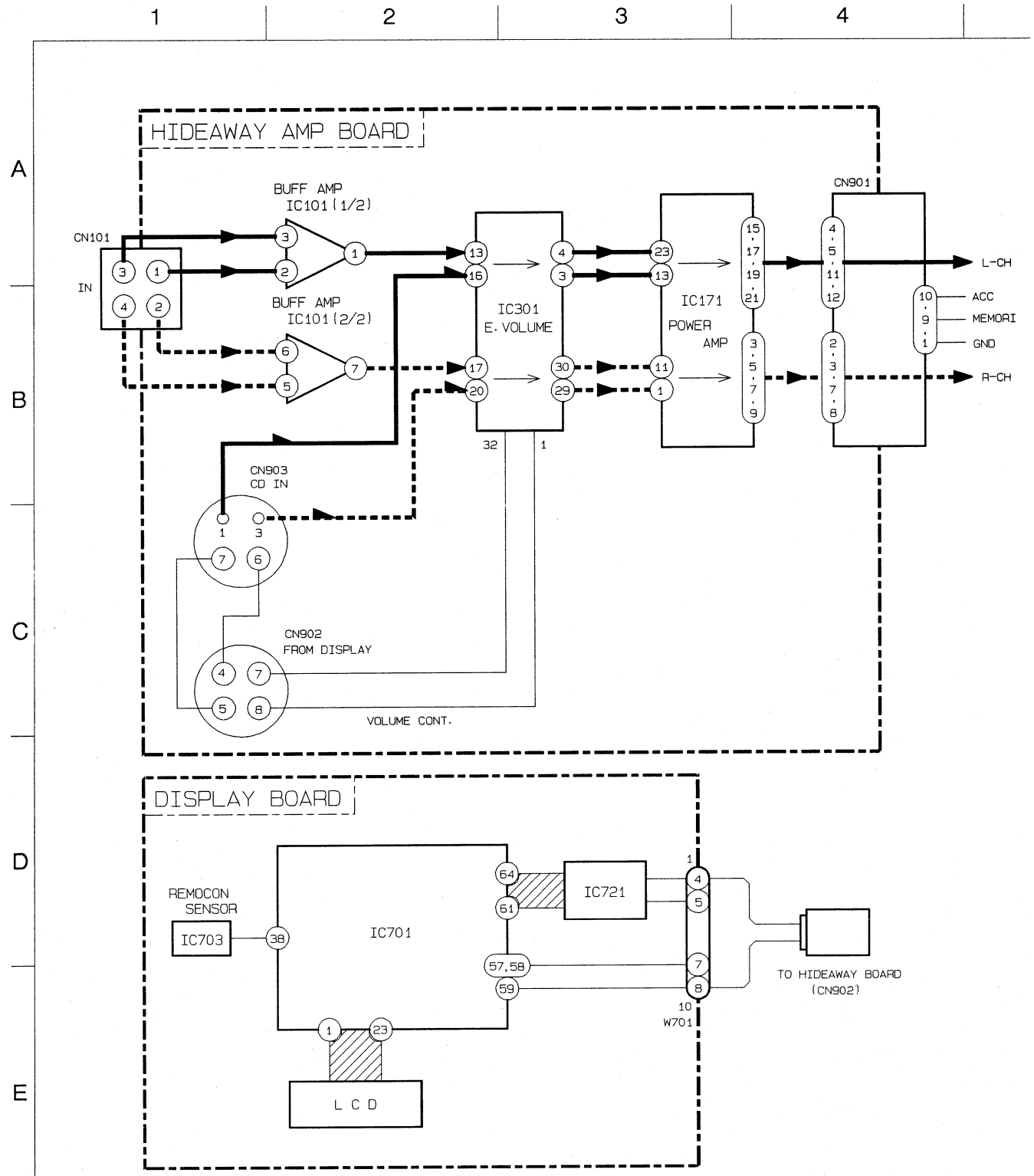
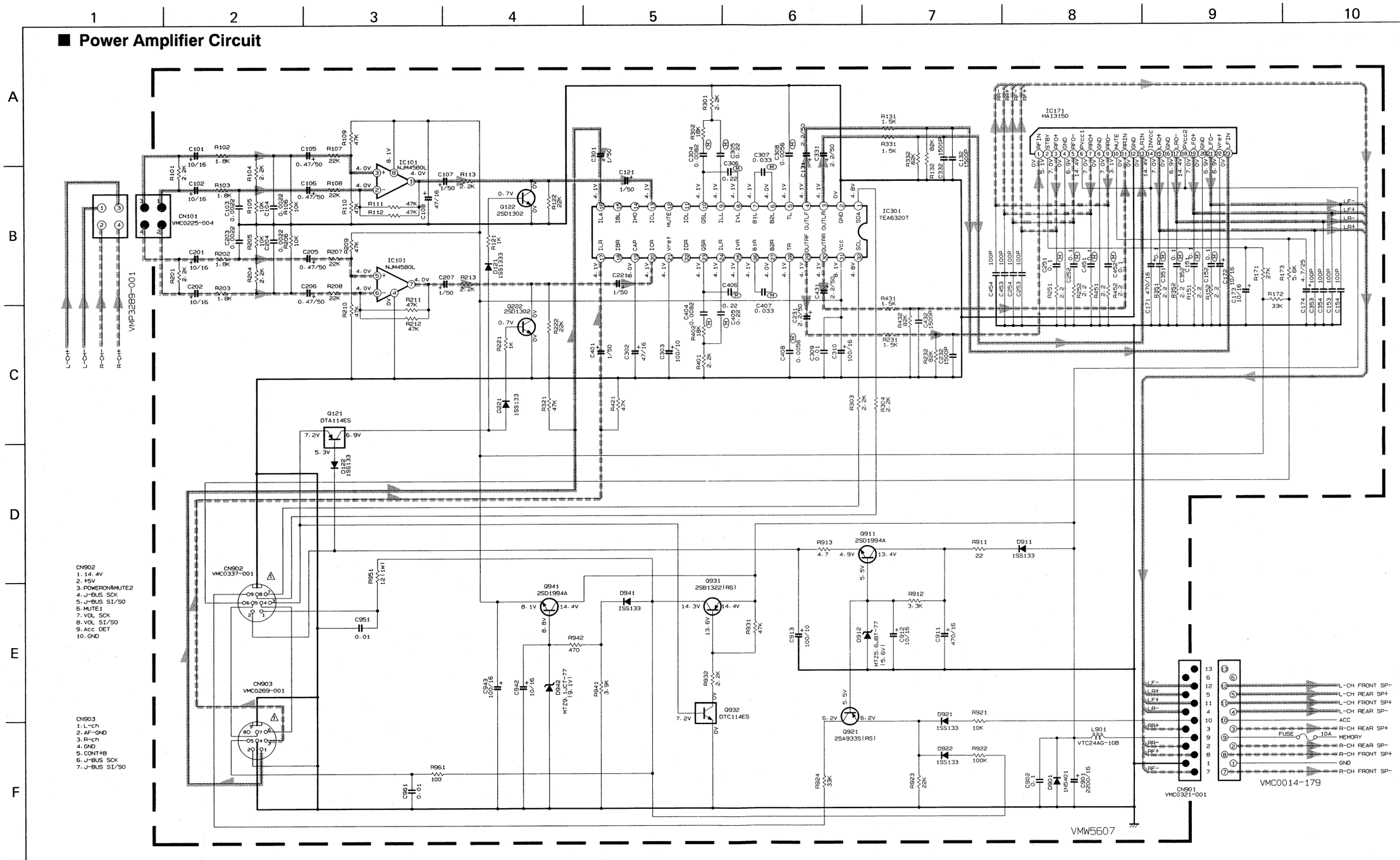


Fig3-1

4 Standard schematic diagram

■ Power Amplifier Circuit



CN902
1. 14.4V
2. 45V
3. POWERON&MUTE2
4. J-BUS SCK
5. J-BUS SI/SO
6. MUTE1
7. VOL SCK
8. VOL SI/SO
9. Acc DET
10. GND

CN903
1. L-ch
2. AF-GND
3. R-ch
4. GND
5. CONT+B
6. J-BUS SCK
7. J-BUS SI/SO

Fig4-1

L / R Playback signal line

L / R CD Signal line

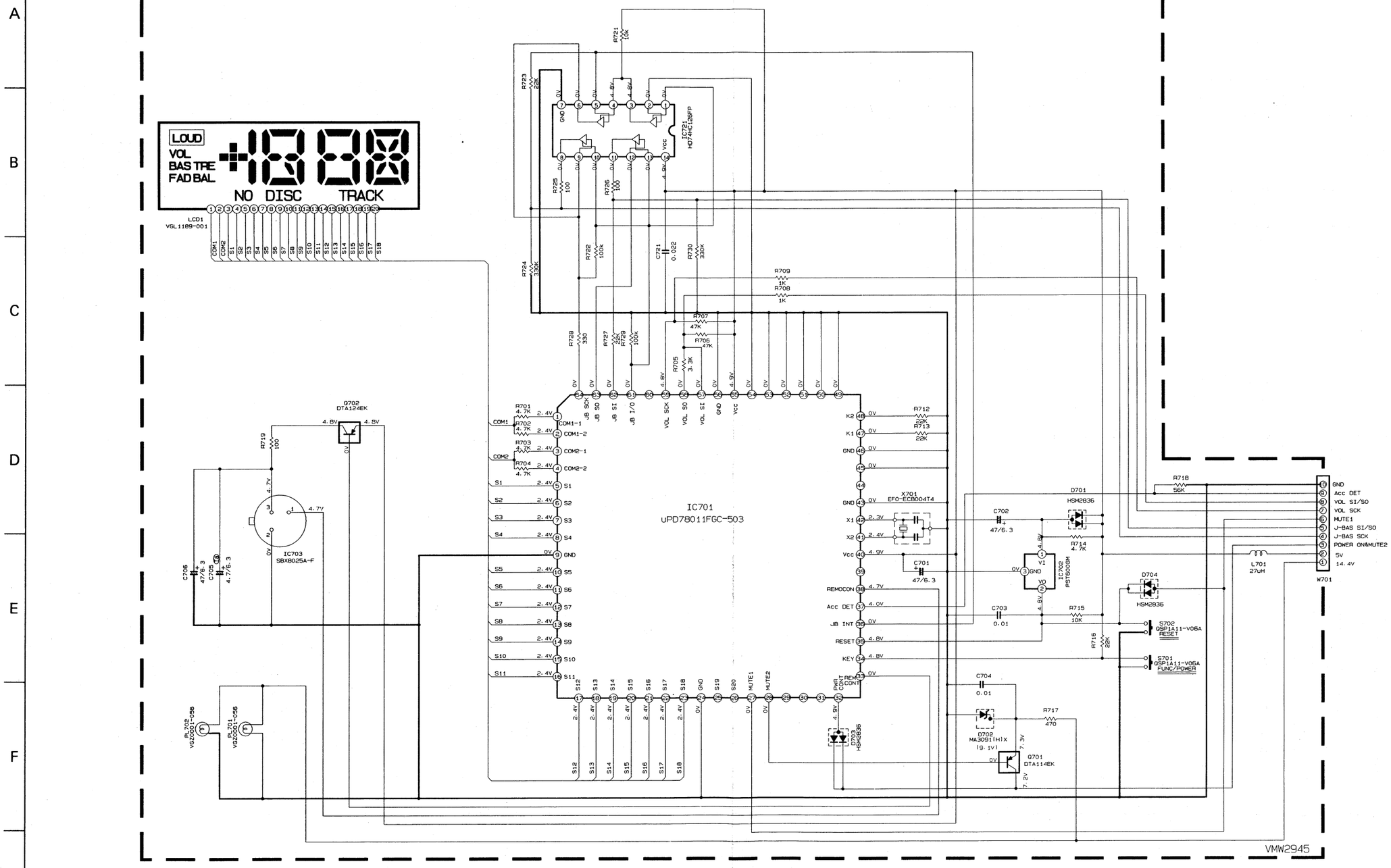
NOTES

1. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER WITHOUT INPUT SIGNAL.
   CONDITION---CD MODE
2. UNLESS OTHERWISE SPECIFIED.
   ALL RESISTORS ARE 1/6W ±5% CARBON RESISTOR.
   ALL CAPACITORS ARE 50V OR 25V CERAMIC CAPACITOR.
   ALL RESISTANCE VALUES ARE IN OHM(Ω).
   ALL CAPACITANCE VALUES ARE IN μF(P=pF).
   ALL E.CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE(μF)RATED VOLTAGE(V).

(M) — 50V ±5% MYLAR CAPACITOR OR 50V ±5% THIN FILM CAPACITOR

Note
VDH3675001AV

■ Controller (Display) Circuit



NOTES
1. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER WITHOUT INPUT SIGNAL CONDITION---CD MODE
2. UNLESS OTHERWISE SPECIFIED.
   ALL RESISTORS ARE 1/10W ±5% METAL GLAZE RESISTOR.
   ALL CAPACITORS ARE 50V OR 25V CERAMIC CAPACITOR.
   ALL RESISTANCE VALUES ARE IN OHM(Ω)
   ALL CAPACITANCE VALUES ARE IN ±F (P=pF).
   ALL E-CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE(±F)/RATED VOLTAGE(V).
(TE) - T.S.E CAPACITOR

Note
VDH3675001CV

Fig4-2

5 Location of p.c.board parts and parts List

1 2 3 4

A B C D E F

■ Power Amplifier board

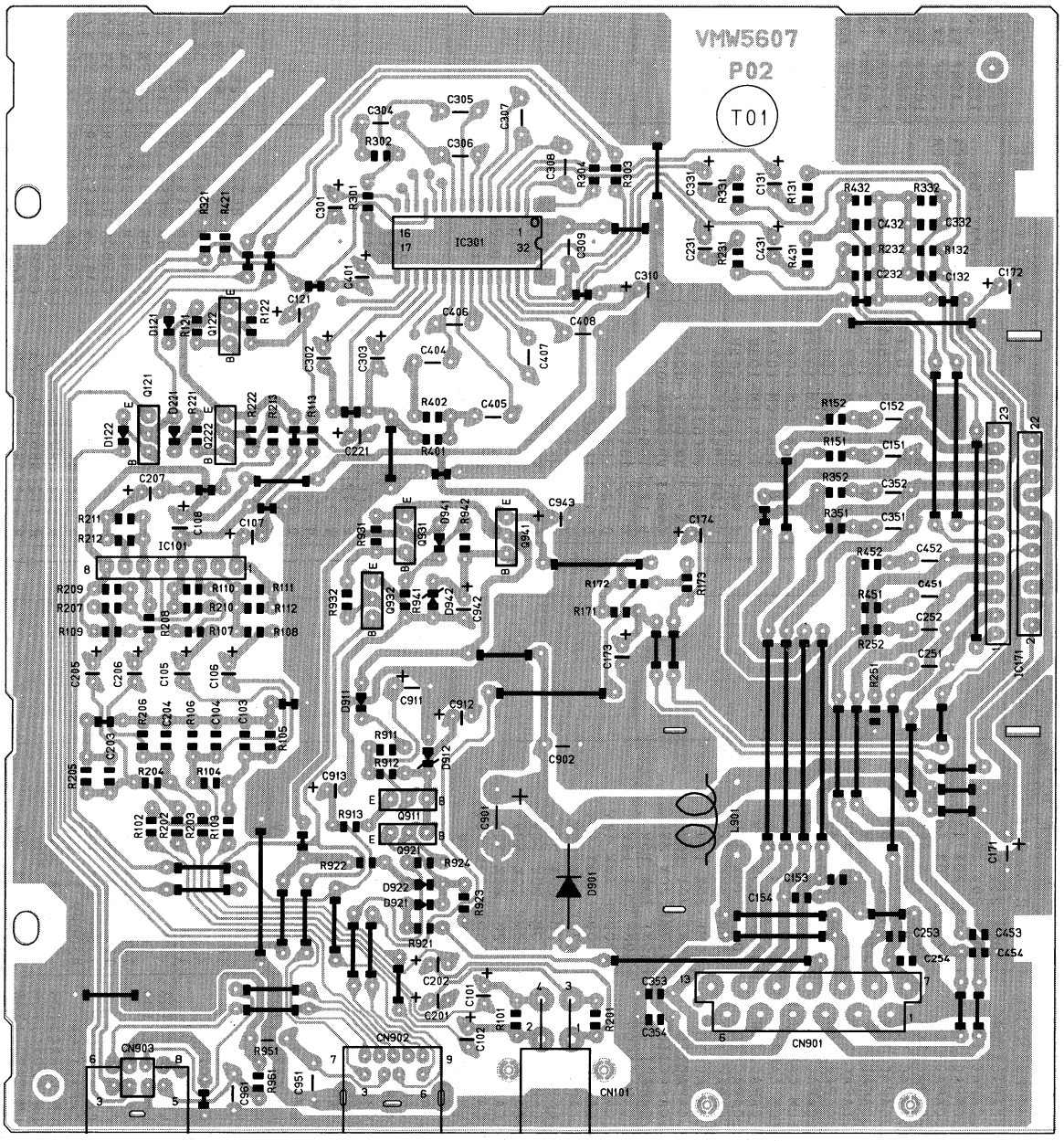


Fig5-1

MAIN
VMW5607

● Power amplifier board parts list

BLOCK NO. 01

⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	SUFFIX
	C 101	QEK41CM-106	E.CAPACITOR	10MF 20% 16V	
	C 102	QEK41CM-106	E.CAPACITOR	10MF 20% 16V	
	C 103	QCXB1CM-222Y	C.CAPACITOR	2200PF 20% 16V	
	C 104	QCXB1CM-222Y	C.CAPACITOR	2200PF 20% 16V	
	C 105	QEK41HM-474	E.CAPACITOR	.47MF 20% 50V	
	C 106	QEK41HM-474	E.CAPACITOR	.47MF 20% 50V	
	C 107	QEK41HM-105	E.CAPACITOR	1.0MF 20% 50V	
	C 108	QEK41CM-476	E.CAPACITOR	47MF 20% 16V	
	C 121	QEK41HM-105	E.CAPACITOR	1.0MF 20% 50V	
	C 131	QEK41HM-225	E.CAPACITOR	2.2MF 20% 50V	
	C 132	QCXB1CM-152Y	C.CAPACITOR	1500PF 20% 16V	
	C 151	QFV41HJ-104ZM	FILM CAPACITOR	.10MF 5% 50V	
	C 152	QFV41HJ-104ZM	FILM CAPACITOR	.10MF 5% 50V	
	C 153	QCBB1HK-101Y	C.CAPACITOR	100PF 10% 50V	
	C 154	QCBB1HK-101Y	C.CAPACITOR	100PF 10% 50V	
	C 171	QET41CM-477	E.CAPACITOR	470MF 20% 16V	
	C 172	QEK41CM-106	E.CAPACITOR	10MF 20% 16V	
	C 173	QEK41CM-106	E.CAPACITOR	10MF 20% 16V	
	C 174	QEK41EM-475	E.CAPACITOR	4.7MF 20% 25V	
	C 201	QEK41CM-106	E.CAPACITOR	10MF 20% 16V	
	C 202	QEK41CM-106	E.CAPACITOR	10MF 20% 16V	
	C 203	QCXB1CM-222Y	C.CAPACITOR	2200PF 20% 16V	
	C 204	QCXB1CM-222Y	C.CAPACITOR	2200PF 20% 16V	
	C 205	QEK41HM-474	E.CAPACITOR	.47MF 20% 50V	
	C 206	QEK41HM-474	E.CAPACITOR	.47MF 20% 50V	
	C 207	QEK41HM-105	E.CAPACITOR	1.0MF 20% 50V	
	C 221	QEK41HM-105	E.CAPACITOR	1.0MF 20% 50V	
	C 231	QEK41HM-225	E.CAPACITOR	2.2MF 20% 50V	
	C 232	QCXB1CM-152Y	C.CAPACITOR	1500PF 20% 16V	
	C 251	QFV41HJ-104ZM	FILM CAPACITOR	.10MF 5% 50V	
	C 252	QFV41HJ-104ZM	FILM CAPACITOR	.10MF 5% 50V	
	C 253	QCBB1HK-101Y	C.CAPACITOR	100PF 10% 50V	
	C 254	QCBB1HK-101Y	C.CAPACITOR	100PF 10% 50V	
	C 301	QEK41HM-105	E.CAPACITOR	1.0MF 20% 50V	
	C 302	QEK41CM-476	E.CAPACITOR	47MF 20% 16V	
	C 303	QEKF1AM-107ZN	E.CAPACITOR	100MF 20% 10V	
	C 304	QFLA1HJ-822ZM	M.CAPACITOR	8200PF 5% 50V	
	C 305	QFV41HJ-224	FILM CAPACITOR	.22MF 5% 50V	
	C 306	QFV41HJ-224	FILM CAPACITOR	.22MF 5% 50V	
	C 307	QFV41HJ-333	FILM CAPACITOR	.033MF 5% 50V	
	C 308	QFLA1HJ-562ZM	M.CAPACITOR	5600PF 5% 50V	
	C 309	QCF11HP-103	C.CAPACITOR	.010MF +100:-0%	
	C 310	QEKF1CM-107ZN	E.CAPACITOR	100MF 20% 16V	
	C 331	QEK41HM-225	E.CAPACITOR	2.2MF 20% 50V	
	C 332	QCXB1CM-152Y	C.CAPACITOR	1500PF 20% 16V	
	C 351	QFV41HJ-104ZM	FILM CAPACITOR	.10MF 5% 50V	
	C 352	QFV41HJ-104ZM	FILM CAPACITOR	.10MF 5% 50V	
	C 353	QCBB1HK-101Y	C.CAPACITOR	100PF 10% 50V	
	C 354	QCBB1HK-101Y	C.CAPACITOR	100PF 10% 50V	
	C 401	QEK41HM-105	E.CAPACITOR	1.0MF 20% 50V	
	C 404	QFLA1HJ-822ZM	M.CAPACITOR	8200PF 5% 50V	
	C 405	QFV41HJ-224	FILM CAPACITOR	.22MF 5% 50V	
	C 406	QFV41HJ-224	FILM CAPACITOR	.22MF 5% 50V	
	C 407	QFV41HJ-333	FILM CAPACITOR	.033MF 5% 50V	
	C 408	QFLA1HJ-562ZM	M.CAPACITOR	5600PF 5% 50V	

● Power amplifier board parts list

BLOCK NO. 01

⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	SUFFIX
	C 431	QEK41HM-225	E.CAPACITOR	2.2MF 20% 50V	
	C 432	QCXB1CM-152Y	C.CAPACITOR	1500PF 20% 16V	
	C 451	QFV41HJ-104ZM	FILM CAPACITOR	.10MF 5% 50V	
	C 452	QFV41HJ-104ZM	FILM CAPACITOR	.10MF 5% 50V	
	C 453	QCBB1HK-101Y	C.CAPACITOR	100PF 10% 50V	
	C 454	QCBB1HK-101Y	C.CAPACITOR	100PF 10% 50V	
	C 901	QET41CR-228L16	E.CAPACITOR	2200MF +30:-10%	
	C 903	QCFB1EZ-103Y	C.CAPACITOR	.010MF +80:-20%	
	C 911	QET41CM-477	E.CAPACITOR	470MF 20% 16V	
	C 912	QEK41CM-106	E.CAPACITOR	10MF 20% 16V	
	C 913	QEKF1AM-107ZN	E.CAPACITOR	100MF 20% 10V	
	C 942	QEK41CM-106	E.CAPACITOR	10MF 20% 16V	
	C 943	QEKF1CM-107ZN	E.CAPACITOR	100MF 20% 16V	
	C 951	QCC11EM-103V	C.CAPACITOR	.010MF 20% 25V	
	C 961	QCC11EM-103V	C.CAPACITOR	.010MF 20% 25V	
	CN101	VMC0225-004	CONNECTOR		
	CN901	VMC0321-001	13PIN CONN		
	CN902	VMC0337-001	9PIN CONNECTER		
	CN903	VMC0269-001	MINI DIN JACK		
	D 121	1SS133	SI DIODE		
	D 122	1SS133	SI DIODE		
	D 221	1SS133	SI DIODE		
	D 901	1N5401TM	SI DIODE		
	D 911	1SS133	SI DIODE		
	D 912	MTZ5.6JB	ZENER DIODE		
	D 921	1SS133	SI DIODE		
	D 922	1SS133	SI DIODE		
	D 941	1SS133	SI DIODE		
	D 942	MTZ9.1JC	ZENER DIODE		
	IC101	NJM4580L	IC		
	IC171	HA13150A	IC		
	IC301	TEA6320T	IC		
	L 901	VTC24AG-10B	CHOKE COIL		
	Q 121	DTA114ES	TRANSISTOR		
	Q 122	2SD1302	TRANSISTOR		
	Q 222	2SD1302	TRANSISTOR		
	Q 911	2SD1994A(R,S)TA	TRANSISTOR		
	Q 921	2SA933S(RS)	TRANSISTOR		
	Q 931	2SB1322(RS)	TRANSISTOR		
	Q 932	DTC114ESTP	TRANSISTOR		
	Q 941	2SD1994A(R,S)TA	TRANSISTOR		
	R 101	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 102	QRD161J-182	CARBON RESISTOR	1.8K 5% 1/6W	
	R 103	QRD161J-182	CARBON RESISTOR	1.8K 5% 1/6W	
	R 104	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 105	QRD161J-103	CARBON RESISTOR	10K 5% 1/6W	
	R 106	QRD161J-103	CARBON RESISTOR	10K 5% 1/6W	
	R 107	QRD161J-223	CARBON RESISTOR	22K 5% 1/6W	
	R 108	QRD161J-223	CARBON RESISTOR	22K 5% 1/6W	
	R 109	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 110	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 111	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 112	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 113	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 121	QRD161J-102	CARBON RESISTOR	1.0K 5% 1/6W	

BLOCK NO. 01

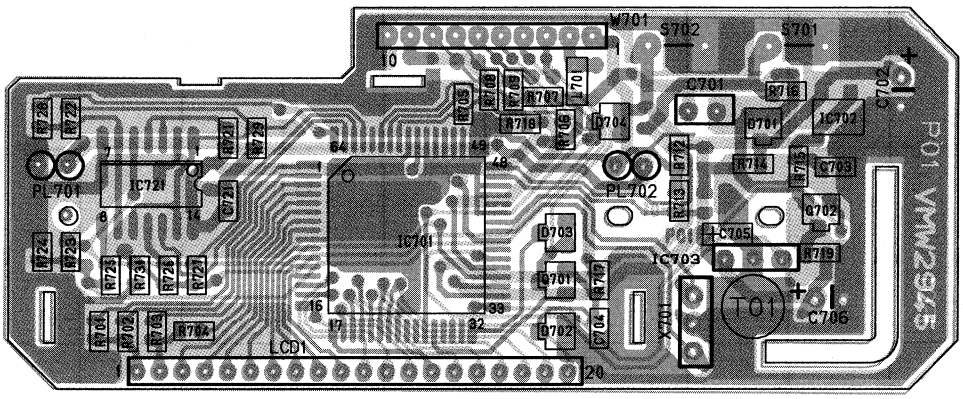
⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	SUFFIX
	R 122	QRD161J-223	CARBON RESISTOR	22K 5% 1/6W	
	R 131	QRD161J-152	CARBON RESISTOR	1.5K 5% 1/6W	
	R 132	QRD161J-823	CARBON RESISTOR	82K 5% 1/6W	
	R 151	QRD161J-2R2	CARBON RESISTOR	2.2 5% 1/6W	
	R 152	QRD161J-2R2	CARBON RESISTOR	2.2 5% 1/6W	
	R 171	QRD161J-273	CARBON RESISTOR	27K 5% 1/6W	
	R 172	QRD161J-333	CARBON RESISTOR	33K 5% 1/6W	
	R 173	QRD167J-562	CARBON RESISTOR	5.6K 5% 1/6W	
	R 201	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 202	QRD161J-182	CARBON RESISTOR	1.8K 5% 1/6W	
	R 203	QRD161J-182	CARBON RESISTOR	1.8K 5% 1/6W	
	R 204	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 205	QRD161J-103	CARBON RESISTOR	10K 5% 1/6W	
	R 206	QRD161J-103	CARBON RESISTOR	10K 5% 1/6W	
	R 207	QRD161J-223	CARBON RESISTOR	22K 5% 1/6W	
	R 208	QRD161J-223	CARBON RESISTOR	22K 5% 1/6W	
	R 209	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 210	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 211	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 212	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 213	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 221	QRD161J-102	CARBON RESISTOR	1.0K 5% 1/6W	
	R 222	QRD161J-223	CARBON RESISTOR	22K 5% 1/6W	
	R 231	QRD161J-152	CARBON RESISTOR	1.5K 5% 1/6W	
	R 232	QRD161J-823	CARBON RESISTOR	82K 5% 1/6W	
	R 251	QRD161J-2R2	CARBON RESISTOR	2.2 5% 1/6W	
	R 252	QRD161J-2R2	CARBON RESISTOR	2.2 5% 1/6W	
	R 301	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 302	QRD161J-183	CARBON RESISTOR	18K 5% 1/6W	
	R 303	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 304	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 321	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 331	QRD161J-152	CARBON RESISTOR	1.5K 5% 1/6W	
	R 332	QRD161J-823	CARBON RESISTOR	82K 5% 1/6W	
	R 351	QRD161J-2R2	CARBON RESISTOR	2.2 5% 1/6W	
	R 352	QRD161J-2R2	CARBON RESISTOR	2.2 5% 1/6W	
	R 401	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 402	QRD161J-183	CARBON RESISTOR	18K 5% 1/6W	
	R 421	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 431	QRD161J-152	CARBON RESISTOR	1.5K 5% 1/6W	
	R 432	QRD161J-823	CARBON RESISTOR	82K 5% 1/6W	
	R 451	QRD161J-2R2	CARBON RESISTOR	2.2 5% 1/6W	
	R 452	QRD161J-2R2	CARBON RESISTOR	2.2 5% 1/6W	
	R 911	QRD161J-220	CARBON RESISTOR	22 5% 1/6W	
	R 912	QRD167J-332	CARBON RESISTOR	3.3K 5% 1/6W	
	R 913	QRD167J-4R7	CARBON RESISTOR	4.7 5% 1/6W	
	R 921	QRD161J-103	CARBON RESISTOR	10K 5% 1/6W	
	R 922	QRD161J-104	CARBON RESISTOR	100K 5% 1/6W	
	R 923	QRD161J-223	CARBON RESISTOR	22K 5% 1/6W	
	R 924	QRD161J-333	CARBON RESISTOR	33K 5% 1/6W	
	R 931	QRD161J-473	CARBON RESISTOR	47K 5% 1/6W	
	R 932	QRD161J-222	CARBON RESISTOR	2.2K 5% 1/6W	
	R 941	QRD161J-392	CARBON RESISTOR	3.9K 5% 1/6W	
	R 942	QRD161J-471	CARBON RESISTOR	470 5% 1/6W	
	R 951	QRG01DJ-120X	OMF.RESISTOR	12 5% 1/1W	

BLOCK NO. 01

⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	SUFFIX
	R 961	QRD161J-101	CARBON RESISTOR	100 5% 1/6W	

■ Controller (Display) board

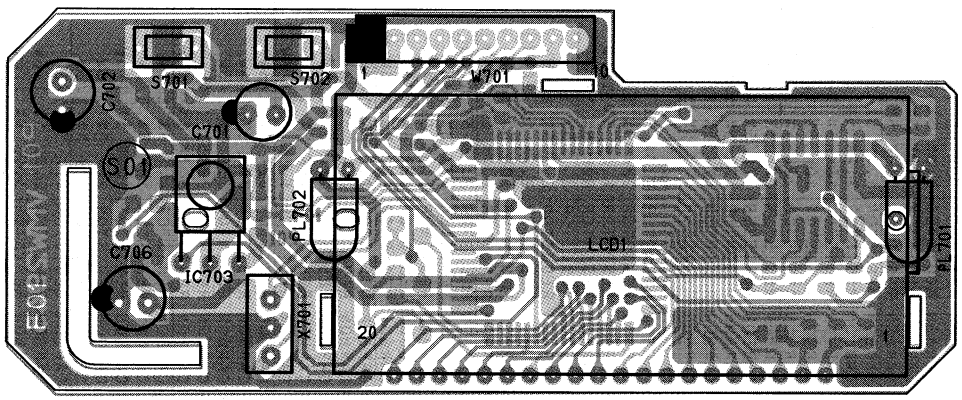
◆ Bottom side



■ Top of side

Fig5-2

◆ Top side (parts side)



■ Bottom of side

Fig5-3

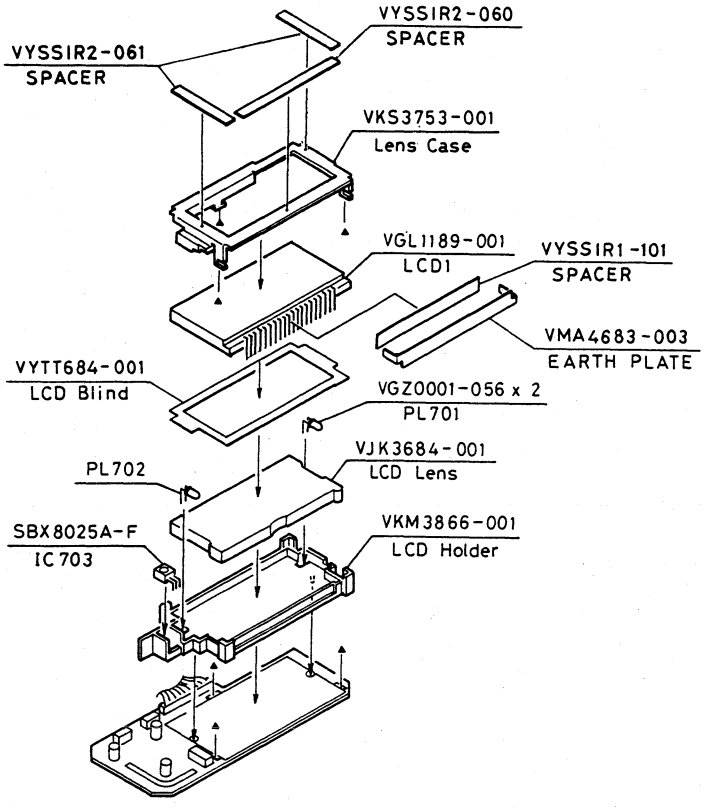
● Display board parts list

● Display board parts list

BLOCK NO. 02

⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	SUFFIX
	C 701	QEK40JM-476T	E CAPACITOR	47MF 20% 6.3V	
	C 702	QEKF0JM-476ZN	E.CAPACITOR	47MF 20% 6.3V	
	C 703	NCB21HK-103AY	C CAPACITOR	.010MF 10% 50V	
	C 704	NCB21HK-103AY	C CAPACITOR	.010MF 10% 50V	
	C 705	NEF20JM-475RY	TS.E.CAPACITOR	4.7MF 20% 6.3V	
	C 706	QEKF0JM-476ZN	E.CAPACITOR	47MF 20% 6.3V	
	C 721	NCB21HK-223AY	C CAPACITOR	.022MF 10% 50V	
	D 701	HSM2836C	DIODE		
	D 702	MA3091(H)	ZENER DIODE		
	D 703	HSM2836C	DIODE		
	D 704	HSM2836C	DIODE		
	IC701	UPD78011FGC-503	IC(MICON)		
	IC702	PST600GM-T	IC		
	IC703	SBX8025A-F	REMOCON SENSOR		
	IC721	HD74HC126FP	IC		
	L 701	VQP1003-270Y	INDUCTOR		
	LCD 1	VGL1189-001	LCD		
	PL701	VGZ0001-056	LAMP		
	PL702	VGZ0001-056	LAMP		
	Q 701	DTA114EKA-X	TRANSISTOR		
	Q 702	DTA124EK-X	TRANSISTOR		
	R 701	NRSA02J-472NY	MG RESISTOR	4.7K 5% 1/10W	
	R 702	NRSA02J-472NY	MG RESISTOR	4.7K 5% 1/10W	
	R 703	NRSA02J-472NY	MG RESISTOR	4.7K 5% 1/10W	
	R 704	NRSA02J-472NY	MG RESISTOR	4.7K 5% 1/10W	
	R 705	NRSA02J-332NY	MG RESISTOR	3.3K 5% 1/10W	
	R 706	NRSA02J-473NY	MG RESISTOR	47K 5% 1/10W	
	R 707	NRSA02J-473NY	MG RESISTOR	47K 5% 1/10W	
	R 708	NRSA02J-102NY	MG RESISTOR	1.0K 5% 1/10W	
	R 709	NRSA02J-102NY	MG RESISTOR	1.0K 5% 1/10W	
	R 712	NRSA02J-223NY	MG RESISTOR	22K 5% 1/10W	
	R 713	NRSA02J-223NY	MG RESISTOR	22K 5% 1/10W	
	R 714	NRSA02J-472NY	MG RESISTOR	4.7K 5% 1/10W	
	R 715	NRSA02J-103NY	MG RESISTOR	10K 5% 1/10W	
	R 716	NRSA02J-223NY	MG RESISTOR	22K 5% 1/10W	
	R 717	NRSA02J-471NY	MG RESISTOR	470 5% 1/10W	
	R 718	NRSA02J-563NY	MG RESISTOR	56K 5% 1/10W	
	R 719	NRSA02J-101NY	MG RESISTOR	100 5% 1/10W	
	R 721	NRSA02J-223NY	MG RESISTOR	22K 5% 1/10W	
	R 722	NRSA02J-104NY	MG RESISTOR	100K 5% 1/10W	
	R 723	NRSA02J-223NY	MG RESISTOR	22K 5% 1/10W	
	R 724	NRSA02J-334NY	MG RESISTOR	330K 5% 1/10W	
	R 725	NRSA02J-101NY	MG RESISTOR	100 5% 1/10W	
	R 726	NRSA02J-101NY	MG RESISTOR	100 5% 1/10W	
	R 727	NRSA02J-223NY	MG RESISTOR	22K 5% 1/10W	
	R 728	NRSA02J-331NY	MG RESISTOR	330 5% 1/10W	
	R 729	NRSA02J-104NY	MG RESISTOR	100K 5% 1/10W	
	R 730	NRSA02J-334NY	MG RESISTOR	330K 5% 1/10W	
	R 732	NRSA02J-473NY	MG RESISTOR	47K 5% 1/10W	
	S 701	QSP1A11-V06AZ	TACT SWITCH	FUNC/PWR	
	S 702	QSP1A11-V06AZ	TACT SWITCH	RESET	
	X 701	EFO-EC8004T4	CERAMIC RESONAT		

■ Exploded view of display assembly



6 Packing illustration and parts list

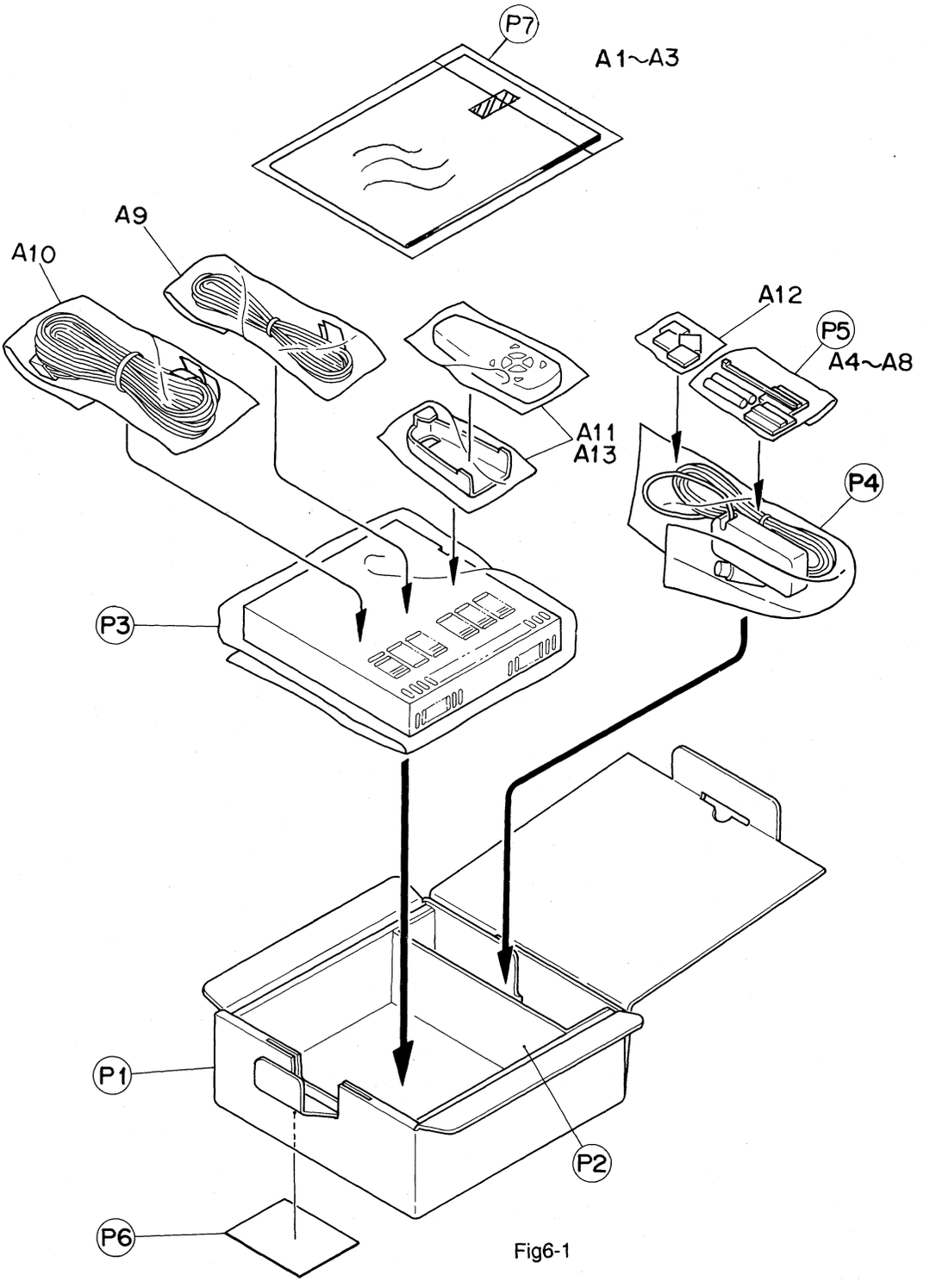


Fig6-1

● **Packing parts list**

BLOCK NO. M3MM

⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	QTY	SUFFIX	CLR
	P 1	VPC3695-S001	CARTON		1		
	P 2	VPK3356-001	CUSHION SHEET		1		
	P 3	VPE3005-066	POLY BAG	FOR KS-RA1 SET	1		
	P 4	QPGA015-05005	ENVELOPE	FOR DISPLAY	1		
	P 5	QPGA008-01205	POLY BAG	SCREW SA	1		
	P 6	----------	LABEL	046838103247	1		
	P 7	QPGA008-01205	POLY BAG	FOR INSTRUCTION	1		

■ Accessories illustration

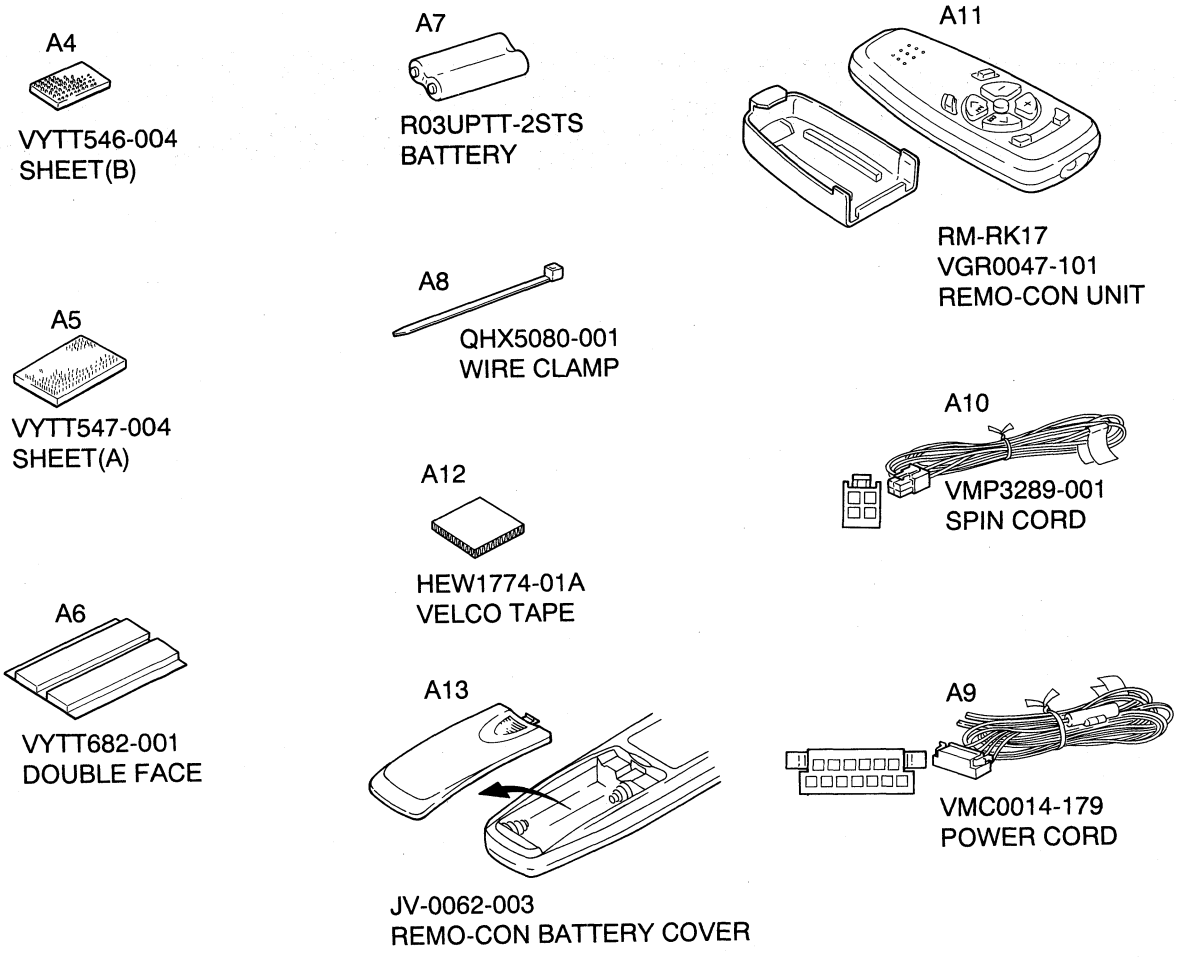


Fig6-2

● Accessories parts list

BLOCK NO. M3MM

⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	QTY	SUFFIX	CLR
	A 1	VNN3695-631S	INSTRUCTIONS		1		
	A 2	BT-20059D	WARRANTY CARD		1	J	
		BT-20025M	WARRANTY CARD		1	C	
	A 3	BT-20071B	SERVICE CENTER		1	C	
		BT-20137	SERVICE CENTER		1	J	
	A 4	VYTT546-004	SHEET(B)	FOR DISPLAY	2		
	A 5	VYTT547-004	SHEET(A)	FOR DISPLAY	2		
	A 6	VYTT682-001	DOUBLE FACE	FOR REMOCON HOL	1		
	A 7	R03UPTT-2STS	BATTERY	AAA OR R03	2		
	A 8	QHX5080-001	WIRE CLAMP		1		
	A 9	VMC0014-179	POWER CORD		1		
	A 10	VMP3289-001	SPIN CORD		1		
	A 11	RM-RK17	REMO-CON UNIT	VGR0047-101	1		
	A 12	HEW1774-01A	VELCRO TAPE SET	(QTY4)	1		
	A 13	JV-0062-003	BATTERY COVER	SERVICE ONLY	1		